

### Arborist Report

TO: SvR Design Company c/o Nathan Polanski

SITE: Olympic Drive (SR 305) between Harborview Drive SE & Winslow Way E  
Bainbridge Island, WA 98110

RE: Inventory & Assessment of Trees in Area of Proposed Improvements

DATE: August 20, 2015

PREPARED BY: Sean Dugan,  
ASCA Registered Consulting Arborist #457, ISA Board Certified  
Master Arborist PN-5459B & Qualified Tree Risk Assessor

Haley Galbraith,  
ISA Certified Arborist & Qualified Tree Risk Assessor

---

#### Summary

We inventoried and assessed twenty-eight (28) trees on site. At least twenty-two (22) of the subject trees will require removal to accommodate proposed plans for site improvements. One (1) tree could be left as a wildlife snag rather than removing completely, and would protect an adjacent tree, likely allowing its retention. Three (3) trees are possibly retainable, and two (2) should be retained and protected.

The subject trees are all native species, including primarily red alder (*Alnus rubra*), bigleaf maple (*Acer macrophyllum*), Douglas-fir (*Pseudotsuga menziesii*), and Pacific madrone (*Arbutus menziesii*). Red alder is a relatively short-lived species, and the individuals on site were all found to have significant structural issues, so we do not recommend retaining any of those in the project area. Douglas-fir and bigleaf maple trees are both fairly tolerant of disturbance, so there is the opportunity for retention of some of those in accordance with the proposed site improvements. Pacific madrone does not tolerate disturbance well, so those should only be retained where disturbance is far enough away or where other trees can be retained as a buffer between them and site work activities.

#### Assignment & Scope of Report

This report outlines the site inspection by Sean Dugan and Haley Galbraith, of Tree Solutions Inc, on August 17, 2015. We were asked to visit the site and provide a formal report outlining our findings and recommendations. Nathan Polanski, of SvR Design Company, requested these services to assist with project planning.

Tree tag number, species, DSH, health and structural condition, proposed action, and additional notes for each tree can be found in the attached Table of Trees. A site survey showing tree locations and corresponding numbers can also be found attached. Photographs taken during our visit, Glossary, and References are included below. Limits of Assignment can be found in Appendix A. Methods can be found in Appendix B. Additional Assumptions and Limiting Conditions can be found in Appendix C.

## Observations & Discussion

The site is located on Bainbridge Island, immediately west of the ferry terminal entrance/exit. The specific area we were asked to perform tree assessments is along the south side of Olympic Drive (SR 305), between Harborview Drive to the east and Winslow Way to the north.

Planned improvements for this area include road expansion to accommodate a new bike lane, and relocation of utilities. Due to site topography, a retaining wall must be installed approximately 30 feet from the existing curb along Olympic Drive. This retaining wall is proposed to span 160 feet. The wall will have four feet of footing, two feet of space for over-excavation, and an additional ten foot easement for equipment access and transport/storage of materials. Therefore, a total distance of roughly 46 feet from the existing curb edge is to be impacted.

During our assessment, we used a laser rangefinder to determine distances of select trees from the southwestern sidewalk edge. Using those distances gave us an additional four feet of sidewalk width, therefore, we knew that any tree measured to be within 42 feet would certainly require removal. Beyond 42 feet, we used our best judgment, based on our observations, knowledge of species characteristics, and individual tree conditions to determine which trees could possibly be retained.

The first nine trees we assessed were red alders, which we found to have significant structural defects. Although a few of these trees were located beyond 42 feet from the sidewalk edge, due to the species and individual tree conditions, we do not recommend any of the alder trees be retained.

From there, we observed a mix of other native tree species. Invasive plants such as English ivy (*Hedera helix*) vines and Himalayan blackberry (*Rubus bifrons*) canes were prevalent, and covered the trunks of many of the trees and a few standing dead trees, which are noted on the marked-up [site survey](#). Invasive coverage reduced visibility and limited access to some trees, so in those cases DSH was estimated or adjusted accordingly.

In addition to the retaining wall, a catch basin with dispersal trench (approximately 18 inches deep by 12 to 15 inches wide) is to be installed. Utility poles will be relocated as well, but this work should also take place within the area designated for the retaining wall.

The attached [Table of Trees](#) provides detailed information about each tree assessed. Only five of the trees assessed may be candidates for retention. Two of these are bigleaf maples located more than 50 feet from the sidewalk edge which may require canopy pruning for clearance of the work zone. One of these is a madrone tree which may only be retainable if the adjacent fir is left partially intact as a wildlife snag, and finally, two trees (one madrone and one fir) that are located well outside of the work zone should be retained and protected without concern.

Invasives removal should occur before tree removal. Tree removals on site should then be carried out carefully, so as not to damage trees proposed for retention. Once tree removal is complete, it is advisable to have one of our arborists evaluate the remaining trees for altered exposure. This would allow us to determine if pruning of the trees to remain is necessary to minimize risk potential and likelihood of part failure once adjacent trees are gone. At this time, with increased visibility, we would also be able to re-evaluate the potential for retention of some of the trees which are currently questionable to retain.

For instance, if large structural roots are found to the northeast but not as much in other directions, that could deter us from moving forward with retention, as the trees could become destabilized once excavation begins. During this follow-up visit, our arborist could also assist with placement of tree protection fencing.

Tree protection fencing should be installed as soon as possible following tree removals on site. Six foot tall chain link fencing is preferred. Wherever possible, fencing should include multiple trees, rather than having smaller, individual tree protection zones. Desirable native understory plants should also be encompassed by protection areas to the greatest extent possible.

### **Recommendations**

- Remove invasives from the project area.
- Remove trees designated for removal after obtaining proper permissions from the City.
- Have a Tree Solutions arborist return to evaluate remaining trees so that any pruning recommendations can be made and protection fencing can be put in place.
- Maintain tree protection fencing throughout site work activities, and only remove upon project completion – no transport/materials storage allowed within tree protection areas.
- If work is to take place during extended dry periods, supplemental irrigation may be necessary; specific irrigation recommendations can be provided as needed.
- If new landscape plants are to be installed within the drip line areas of retained trees, only hand tools should be used and care should be taken to minimize root disturbance.

## Photographs



Photo 1: Trees 510 (left) & 511 (right) with dead madrone failed and lodged between – remove carefully.

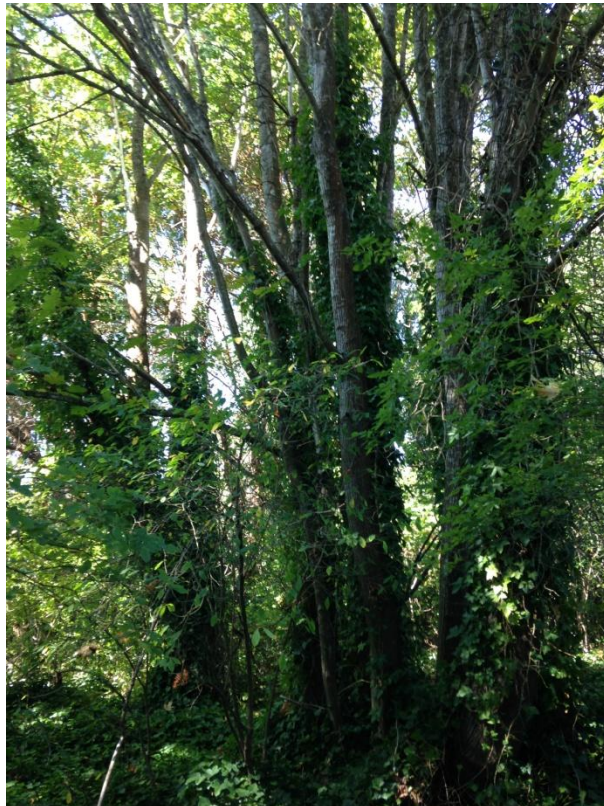


Photo 2: Clump of multi-stem maples to be removed from central site.





Photo 3: Douglas-fir 523 in foreground may be left partially intact as 20-25 foot snag to protect madrone behind.



Photo 4: Madrone tree 527 pointed out by arrow is nice specimen which should be retained and protected.



Photo 5: Douglas-fir tree to right appeared to be in the process of failing – this tree was not tagged, as it is well outside of the work zone, but we feel it should be removed for safety. Adjacent tree in foreground may need to be assessed for altered exposure once hazard tree (marked with pink flagging) is gone.

## Glossary

**ASCA:** American Society of Consulting Arborists

**co-dominant stems:** stems or branches of nearly equal diameter, often weakly attached (Matheny *et al.* 1998)

**crown/canopy:** the aboveground portions of a tree (Lilly 2001)

**DSH:** diameter at standard height; the diameter of the trunk measured 54 inches (4.5 feet) above grade (Matheny *et al.* 1998)

**ISA:** International Society of Arboriculture

**included bark:** bark that becomes embedded in a crotch between branch and trunk or between co-dominant stems and causes a weak structure (Lilly 2001)

**mitigation:** process of reducing damages or risk (Lilly 2001)

**snag:** a tree left partially standing for the primary purpose of providing habitat for wildlife

**structural defects:** flaws, decay, or other faults in the trunk, branches, or root collar of a tree, which may lead to failure (Lilly 2001)

**Visual Tree Assessment (VTA):** method of evaluating structural defects and stability in trees by noting the pattern of growth. Developed by Claus Mattheck (Harris, *et al* 1999)

## References

ANSI A300 (Part 1) – 2008 American National Standards Institute. American National Standard for Tree Care Operations: Tree, Shrub, and Other Woody Plant Maintenance: Standard Practices (Pruning). New York: Tree Care Industry Association, 2008.

Dunster & Associates Environmental Consultants Ltd. Assessing Trees in Urban Areas and the Urban-Rural Interface, US Release 1.0. Silverton: Pacific Northwest Chapter ISA, 2006.

Dunster, Julian A., E. Thomas Smiley, Nelda Matheny, and Sharon Lilly. Tree Risk Assessment Manual. Champaign, Illinois: International Society of Arboriculture, 2013.

E. Smiley, N. Matheny, S. Lilly. Best Management Practices: TREE RISK ASSESSMENT. ISA 2011.

Lilly, Sharon. Arborists' Certification Study Guide. Champaign, IL: The International Society of Arboriculture, 2001.

Matheny, Nelda and James R. Clark. Trees and Development: A Technical Guide to Preservation of Trees During Land Development. Champaign, IL: International Society of Arboriculture, 1998.

Mattheck, Claus and Helge Breloer, The Body Language of Trees.: A Handbook for Failure Analysis. London: HMSO, 1994.

## **Appendix A - Limits of Assignment**

Unless stated otherwise: 1) information contained in this report covers only those trees that were examined and reflects the condition of those trees at the time of inspection; and 2) the inspection is limited to visual examination of the subject trees without dissection, excavation, probing, climbing, or coring unless explicitly specified. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

Tree Solutions did not review any reports or perform any tests related to the soil located on the subject property unless outlined in the scope of services. Tree Solutions staff are not and do not claim to be soils experts. An independent inventory and evaluation of the soils on site should be obtained by a qualified professional if additional understanding of the site characteristics is needed to make an informed decision.

## **Appendix B - Methods**

We evaluated tree health and structure utilizing visual tree assessment (VTA) methods. The basis behind VTA is the identification of symptoms, which trees produce in reaction to weak spots or areas of mechanical stress. Trees react to mechanical and physiological stresses by growing more vigorously to re-enforce weak areas, while depriving less stressed parts (Mattheck & Breloer 1994). Understanding uniform stress allows us to make informed judgments about the condition of a tree.

We measured the diameter of each tree at 54 inches above grade, diameter at standard height (DSH). Where a tree had multiple stems, we measured each stem individually at standard height and determined a single-stem equivalent diameter by using the method outlined in the Guide for Plant Appraisal, 9<sup>th</sup> Edition, published by the Council of Tree and Landscape Appraisers.



## **Appendix C - Assumptions & Limiting Conditions**

1. Consultant assumes that any legal description provided to Consultant is correct and that title to property is good and marketable. Consultant assumes no responsibility for legal matters. Consultant assumes all property appraised or evaluated is free and clear, and is under responsible ownership and competent management.
2. Consultant assumes that the property and its use do not violate applicable codes, ordinances, statutes or regulations.
3. Although Consultant has taken care to obtain all information from reliable sources and to verify the data insofar as possible, Consultant does not guarantee and is not responsible for the accuracy of information provided by others.
4. Client may not require Consultant to testify or attend court by reason of any report unless mutually satisfactory contractual arrangements are made, including payment of an additional fee for such Services as described in the Consulting Arborist Agreement.
5. Unless otherwise required by law, possession of this report does not imply right of publication or use for any purpose by any person other than the person to whom it is addressed, without the prior express written consent of the Consultant.
6. Unless otherwise required by law, no part of this report shall be conveyed by any person, including the Client, the public through advertising, public relations, news, sales or other media without the Consultant's prior express written consent.
7. This report and any values expressed herein represent the opinion of the Consultant, and the Consultant's fee is in no way contingent upon the reporting of a specific value, a stipulated result, the occurrence of a subsequent event or upon any finding to be reported.
8. All photographs included in this report were taken by Tree Solutions Inc. during the documented site visit, unless otherwise noted.
9. Sketches, drawings and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys. The reproduction of any information generated by architects, engineers or other consultants and any sketches, drawings or photographs is for the express purpose of coordination and ease of reference only. Inclusion of such information on any drawings or other documents does not constitute a representation by Consultant as to the sufficiency or accuracy of the information.
10. Unless otherwise agreed, (1) information contained in this report covers only the items examined and reflects the condition of the those items at the time of inspection; and (2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, climbing, or coring. Consultant makes no warranty or guarantee, express or implied, that the problems or deficiencies of the plans or property in question may not arise in the future.
11. Loss or alteration of any part of this Agreement invalidates the entire report.

Tree #	Scientific Name	Common Name	DSH (inches)	DSH stem (inches)	multi-	Health Condition	Structural Condition	Proposed Action	Notes
501	<i>Alnus rubra</i>	Red alder	22.0			Good	Fair	Remove	Phototropic lean to east.
502	<i>Alnus rubra</i>	Red alder	12.0			Good	Fair	Remove	Suppressed.
503	<i>Alnus rubra</i>	Red alder	23.8			Good	Fair	Remove	Trunk lean - phototropic lean to east. Basal trunk wound.
504	<i>Alnus rubra</i>	Red alder	19.0			Fair	Poor	Remove	Significant trunk lean to west. Basal trunk wound and trunk cavity with visible decay.
505	<i>Alnus rubra</i>	Red alder	15.0			Fair	Poor	Remove	Previously topped for line clearance. Severe basal trunk wounds with visible decay and weak response growth.
506	<i>Alnus rubra</i>	Red alder	18.0			Fair	Fair	Remove	Basal trunk wound.
507	<i>Alnus rubra</i>	Red alder	22.7*	15.0, 17.0		Fair	Poor	Remove	Heavy ivy coverage on both stems.
508	<i>Alnus rubra</i>	Red alder	13.0			Good	Fair	Remove	No ivy on trunk. Low live crown ratio.
509	<i>Alnus rubra</i>	Red alder	15.0			Fair	Poor	Remove	Heavy ivy coverage. Leans toward Olympic Drive.
510	<i>Prunus emarginata</i>	Bitter cherry	13.0			Fair	Poor	Remove	Severe basal cankers. Leans on dead madrone tree.
511	<i>Acer macrophyllum</i>	Bigleaf maple	16.0			Good	Fair	Remove	Ivy at base. Supporting dead/failed madrone tree.
512	<i>Arbutus menziesii</i>	Pacific madrone	16.0			Fair	Good	Remove	Heavy ivy coverage at base.
513	<i>Pseudotsuga menziesii</i>	Douglas-fir	34.0			Good	Good	Remove	Heavy ivy coverage at base.
514	<i>Acer macrophyllum</i>	Bigleaf maple	17.0			Good	Good	Possibly retainable	
515	<i>Acer macrophyllum</i>	Bigleaf maple	19.0			Good	Fair	Possibly retainable	Heavy ivy coverage at base.
516	<i>Acer macrophyllum</i>	Bigleaf maple	12.0			Fair	Fair	Remove	
517	<i>Acer macrophyllum</i>	Bigleaf maple	18.7*	4.0, 8.0, 10.0, 13.0		Fair	Fair	Remove	
518	<i>Acer macrophyllum</i>	Bigleaf maple	19.4*	8.0, 12.0, 13.0		Fair	Fair	Remove	
519	<i>Salix scouleriana</i>	Scouler's willow	12.0			Good	Poor	Remove	Repeatedly topped in past for line clearance.

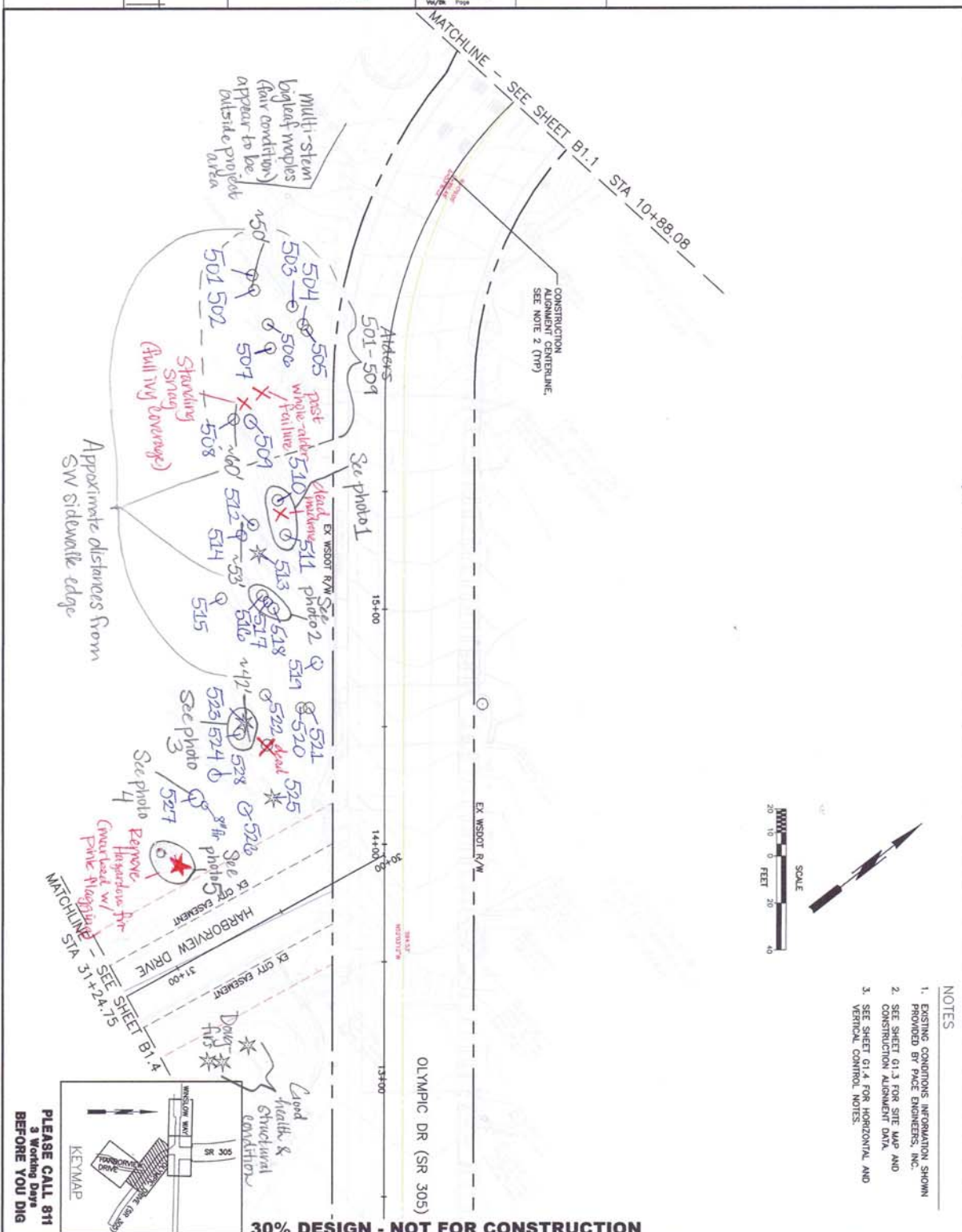
Tree #	Scientific Name	Common Name	DSH (inches)	DSH stem (inches)	DSH multi-	Health Condition	Structural Condition	Proposed Action	Notes
520	<i>Acer macrophyllum</i>	Bigleaf maple	12.0			Good	Good	Remove	
521	<i>Acer macrophyllum</i>	Bigleaf maple	18.4*	5.0, 12.0, 13.0		Good	Good	Remove	Ivy coverage at base.
522	<i>Arbutus menziesii</i>	Pacific madrone	20.0			Fair	Fair	Remove	
523	<i>Pseudotsuga menziesii</i>	Douglas-fir	40.0			Good	Good	Leave as wildlife snag?	Not advisable to retain fully intact due to distance of proposed disturbance, but could be left as 20-25 foot tall wildlife snag rather than being completely removed; this would provide buffer for large madrone
									524
524	<i>Arbutus menziesii</i>	Pacific madrone	19.7*	10.0, 17.0		Fair	Good	Possibly retainable if 523 left as snag	
525	<i>Pseudotsuga menziesii</i>	Douglas-fir	32.0			Good	Good	Remove	
526	<i>Acer macrophyllum</i>	Bigleaf maple	16.0			Fair	Good	Remove	Central leader dead.
527	<i>Arbutus menziesii</i>	Pacific madrone	37.4			Good	Good	Retain & protect	Drip line radius 24 feet to northeast.
528	<i>Pseudotsuga menziesii</i>	Douglas-fir	18.0			Good	Fair	Retain & protect - buffer for 527	Odd basal form - possible burl?

**Additional notes:**

DSH (Diameter at Standard Height) is measured 4.5 feet above average grade.

Multi-stem trees are noted (\*), and a single-stem equivalent DSH was calculated using the method defined in the Guide for Plant Appraisal 9th Ed.

Filename: 00_01-2_D057940	Drawn By:	Section:	Surveyed By:	Control Monument:	Recorded Survey Kissop County Auditor	Constructed By:
XREF Filename:	Checked By:		Date:	Field Bk/Pg:	N <sup>o</sup> = =	Date:
					Vol/Bk	Page



- NOTES
1. EXISTING CONDITIONS INFORMATION SHOWN PROVIDED BY PACE ENGINEERS, INC.
  2. SEE SHEET G1.3 FOR SITE MAP AND CONSTRUCTION ALIGNMENT DATA.
  3. SEE SHEET G1.4 FOR HORIZONTAL AND VERTICAL CONTROL NOTES.



**CITY OF  
BAINBRIDGE  
ISLAND**

**PUBLIC WORKS  
ENGINEERING  
DEPARTMENT**

### PROJECT INFORMATION

OLYMPIC DRIVE (SR 305),  
NON-MOTORIZED IMPROVEMENT AND  
WATER MAIN REPLACEMENT PROJECT

SEC.S.26, T.25N, R.2E, W.M.,  
CITY OF BAINBRIDGE ISLAND, KETCHIKAN COUNTY, AK.

## REVISION BLOCK

[illegible]Scale PER PLAN: \_\_\_\_\_  
Metric: \_\_\_\_\_

Coordinate System	WGS 1984 Plate Coordinate System North Zone East and NAD 83
Vertical Datum	NAVD 88
Geopack By	HP
Drawn By	KA
Inspected By	TJS
W.D. Date	
Issue Date	3/17/2015

**SVR**  
**DESIGN COMPANY**  
100A SECOND AVE. SUITE 1000  
NEW YORK, NY 10038  
212.691.1000  
www.svr.com

EXISTING CONDITIONS  
PLAN

B1.2

**PLEASE CALL 811  
3 Working Days  
BEFORE YOU DIG**